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THE PHYSICAL SETTING OF CHINA*

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We believe today that unless one knows the cultural background and physical environment of a people, one cannot really appreciate the full value of the thought of a people. So now in working for a postwar peace, and in promoting better understanding among the people of the world we must try to see and to understand these people in their own setting.

At present there are many peoples from various countries gathering here in China on a great mission and at a great sacrifice. They are not only here as diplomatic officials, fighting forces and cultural representatives pulling together to win this war, but they are also ambassadors of goodwill and friendship. Yet, it is expected that, at times, they must have found the Chinese people different from themselves and the Chinese customs strange. Some of them might even have felt discouraged or disillusioned at times. Yes, indeed, China is a difficult country to understand, because China is a vast country with great variety of land forms and climates which have hampered intercourse and intensified separation and isolation even for the Chinese themselves. Furthermore the culture of the Chinese is complicated, because it not only varies in its stages of historical evolution in its vertical cross section, but also varies in its horizontal distribution due to topography and climatic influences.

In order to understand China one would need to travel thousands of miles not only along the motor roads, but also climb over miles of treacherous mountainous paths in order to visualize fully the areal scene of the physical and cultural landscape, because the

* This paper is based upon an address given to a group of American soldiers while in China. I wish to express sincere appreciation to my very good friend, Therese McQueeny, for helping me to prepare the material for publication.—Liu En-lan.

peoples of each natural region have developed a set of traditions and customs peculiar to their environment which are more or less characterized by isolation. Furthermore, one has to know something of the history of this age old country in order to understand further why the people behave as they do. Because its culture has been influenced by many diverse elements, directly or indirectly from physical environment, it has been tossed by the cross currents of world thought ever since China was discovered by other countries coming by sea routes. To this complex is added the varied aspects of its own cultural heritage. The culture of China has passed thru an extensive process of evolutionary adjustments so that its comprehension is rather intricate.

In this discussion we will limit ourselves only to the physical setting and leave the cultural background for later discussions.

THE LAND

China has an area of about 4,000,000 square miles which is a little larger than the whole of the United States including Alaska, but the population of China is about four times that of the United States. Thus China is a country with a great resource of man power. The tableland of Yunnan and Kweichow are considered to be scantily populated in comparison with the other provinces of the formerly so-called China Proper. But both of the provinces have as many people as the State of New York which is considered to have a higher population figure than any of the other states in America. No wonder in China, wherever one goes, one is vividly impressed by the great masses of inhabitants and their existence on a rather low standard of living. This great population should be an asset, but at the same time it is also a liability.

Most of China is semiarid or mountainous and therefore the great mass of the population is restricted to the eastern half from Peiping following the Taiheng Mountain and southward thru Chengchow, I-chang, Chang-deh and Wuchow of Kwangsi. East of this line, the land area is more or less a flat alluvial land. This region which comprises about 15 per cent of the total land area of China is about equal in size to that of the single province of Sinkiang, but it contains about 70 per cent of the population of China. If the Red Basin of Szechwan is added to the eastern lowlands, this would raise the percentage of the lowland to 17 per cent and the population it supports to 83 per cent of the total, which

leaves 83 per cent of the land area supporting only 17 per cent of the population.

Why did not China develop this vast area in the west? At present the cultivated land for each person is low. It is only about 0.5 acre for each person as compared with about 3 acres per person in the United States. Why does not China develop the West and raise the cultivated land area per capita? Yes, China has made an effort to develop the West ever since the Han dynasty, about 2,000 years ago. But because the natural environment is not as favorable for agriculture as that of the East, man's accomplishment there is in direct proportion to the effort he has exerted in modifying the natural environment. Wherever man's effort decreases, the production from the soil diminishes. Why is it so? Let us now examine the topography and rainfall conditions of China.

Even tho China is known for its great river deltas and plains, yet only one-third of its land area is suitable for producing crops. Compare this with seven-eighths of the land area which is not too rough for producing crops in the United States. This means that the United States has twice as much arable land as that of China.

Besides the mountainous character of the land, rainfall distribution is also unfavorable for China. In the United States much more than half of the country has an annual rainfall of over 20 inches, but in China only one-third of the country has an annual rainfall of over 20 inches; about 25 per cent of the country has an annual rainfall of between 20 and 10 inches, while the rest of the country or about 40 per cent has an annual rainfall of less than 10 inches. These arid regions located in part of the provinces of Sinkiang, Chinghai, Sikang, and the outer territories of Mongolia and Tibet include about 50 per cent of the total land area of China but contain a population of only 6,000,000 which is less than 2 per cent of the total population of China. Thus owing to the limitations both of topography and climate the area of cultivable land is greatly restricted.

At present China has only 208 million acres of land producing crops which is less than 8 per cent of the total land area of China. With a more extensive irrigation system and other scientific improvements the percentage of land for producing crops could be raised to about 20 per cent. Even when all the cultivable land is brought under the plow, the cultivated land area per person will be only about one acre as compared with 3 acres per person in the

United States. This is due to the immensity of the population in China. A careful study of these facts should give us a glimpse into the fundamental question of food supply and standard of living in China. Undoubtedly you have noticed a more plentiful supply of food in war time China when compared with other war countries. But at the same time, if a standard is chosen which will provide for universal material comforts, not to say luxury and the advantages of education be made available to every citizen, then China's low level of subsistence will be more keenly felt than it is at present. This is one of the serious problems that China has to face.

On the other hand, the forest and pastoral resources of China seem to have great potentialities. Tho at present only about 9 per cent of China's land is in forest compared to 25 per cent of the total land area of the United States in forest, there is potential forest land equal to 30 per cent of the total land area of China. The forest industry is as yet not developed in China. Even as near as 200 miles from Chengtu in the northwest of Szechwan, there is unspoiled virgin forest which is neither protected nor appreciated by man because few people know of its existence. There are trees in the deep valleys among the mountains. Transportation is poor and therefore the region is seldom visited by people from the outside. It is difficult for logs to be transported. Land transportation is next to impossible and the rivers are full of cataracts and waterfalls. If China should determine to reforest the barren mountains, not only the soil would be saved but the expansion of the forest industry would be assured. However, better means of transportation is a first essential.

The grazing industry is so far also undeveloped in China. Tho China has only about 20 per cent of its land area suitable for grazing, compared with about 50 per cent in the United States, the grazing industry in China is as yet undeveloped, and still has a future.

Now let us see the picture as a whole of the land of China and that of the United States compared in the following table.

	U.S.A.	CHINA	
	Percentage of Total Land Area	Already in Use	Potential Land Suitable for Use
Farm	23	8	10
Pasture	50		20
Forest	25	9	30
Desert Waste	2	23	

Why should China be at such a disadvantage in the amount of cultivable land area in comparison with that of the United States? This is chiefly (1) due to the location of China; (2) due to the mountainous character of the country; (3) due to the peculiarities in climates.

LOCATION AND MOUNTAIN RANGES

Much of China and the United States lie in the same latitude extending from the belt of the westerlies into the trade wind belt. China's coastline extends from 42° to 18° north latitude, a little farther south than the United States and not quite so far north. At its greatest width China is only half as broad as the United States (122° to 93° east longitude). However the width of the United States comes to a minimum in the trade wind belt while China like Australia has a large part of its land in the trade wind belt. Moreover the United States lies between the Atlantic and the Pacific Oceans with the Gulf of Mexico to the south while China lies at the southeastern extremity of the huge land mass Eurasia and Africa between the Pacific Ocean and an elevated desert of Central Asia.

Superimpose the United States upon Eurasia and you will see that the climate of the west coast of the United States resembles that of western Europe and North Africa. You can compare mean temperatures at Lisbon and San Diego, London and Seattle. The climate of eastern United States and southern Canada resembles that of eastern China with Quebec similar to Manchuria, the Maine coast to Peiping, lower Chesapeake Bay to Shanghai and Jacksonville, Florida to Canton. The Gulf of Mexico has not only rescued the United States from the heavy toll of the trades but also has given more rainfall to the interior of the country. This is why the United States has a larger percentage of land in pastures on the Great Plains while China with no comparable source of water supply has a larger percentage of land in deserts. Without the Gulf of Mexico, the aridity of New Mexico would be felt as far east as Louisiana and Iowa. The American Desert in the southwest corresponds in relative position to that of Sahara, Arabia, Asia Minor, Afghanistan and the Gobi Desert of China. They are all regions cut off from any considerable source of water supply. Trade winds, commonly drying winds, contain much water vapor and yield moisture when cooled to the dewpoint. They are not so cooled over lowlands, hence lowlands swept by the trade winds tend to be dry and the wider the land in the trade wind belt (latitudes 10°

and 15° to 25° and 30°) the larger the desert. Australia, as well as China, illustrates the limitations of lands lying in the trade wind belt.

The United States has a more favorable mountain arrangement than China. The north-south mountain ranges in the west and east of the United States with broad open plains and fertile valleys between them have no counterpart in China. China is a land of high rugged west-east mountain ranges, plateaus and deserts, with river valleys in the east and in Szechwan province giving China its only level fertile lands. The United States has no west-east mountain range to obstruct invasions into the interior of warm moisture laden winds from the Gulf of Mexico in summer or to prevent the passage of the stormy westerlies in winter over the plains and eastward. The north-south mountain ranges of the Sierra Nevadas and Cascades prevent the influence of the Pacific Ocean from going farther inland and so limit the belt of moisture to the Pacific Coastal Region. The Rockies are increasingly dry on their lower slopes but in compensation protect the plateaus to the west from severe cold waves from Canada. Similarly in China, only occasionally do cold waves get into the Red Basin of Szechwan. That is why the winter temperatures of the Red Basin are considerably higher than those of places in the same latitudes in the middle and lower Yangtze Valley. At Chunking which is sheltered from cold winds by mountains, the average winter temperature is about 50°. However this is not the general rule in China. The north-south Appalachian Mountains in eastern United States are not high enough to be an important climatic barrier, so do not offer any real resistance to the cold polar air moving southeastward from Canada in the winter time. As a result continental climate with its frequent cyclonic storms reaches the Atlantic seacoast. Altho the temperatures of China from Peiping to Hongkong are more like the United States from Maine to northern Florida than any other part of the world, the extremely low temperatures occasionally experienced along the Atlantic Seaboard are never recorded in east China. The mountains in the interior of China shield the eastern seacoast from the intense cold of the north. January averages at Canton in the southeast are about 60° F.

Highland Central Asia is more a climatic barrier for China than the Rockies are for the United States because it is one of the driest regions in the world. To the west of the highland of Central

Asia is the continent of Europe which reinforces the drying effect of the mountain barrier. As a result, the influence of the stormy westerlies is practically unfelt in China, having lost their moisture in transit over Europe. Therefore, we may say, in China, the hugeness of the continent of Eurasia exerts even more control upon the climate than the mountain ranges.

In winter Central Asia being the center of an intensified high pressure gives rise to a flow of cold dry winds blowing outward in all directions. The barometric pressure is high at the center and the progress of the winds is comparatively unimpaired by mountain ranges, as they sweep down all over China. These winds are very cold in the north. The mean temperature of the Great Plain of China is generally between 32° and 20° F. Manchuria is colder. At Mukden, January averages are 9°, Peiping 28° and Shanghai 38° F. Being out-blowing winds, they are dry winds so do not cause precipitation in North China but do in South China because the local air in South China is moist and readily condenses in being elevated by the cold air from the northwest. Added to the winter monsoon rain, South China also receives a portion of its late winter and early spring rains from cyclonic storms which are not experienced in Szechwan or in North China.

When the summer months come, the heating of the land and the change from high pressure to low pressure takes place slowly and progressively. Then the northwest winds grow weaker and weaker. Finally the variable winds of April and May gradually change to the summer southeast winds. The ocean winds carry moisture inland and precipitate abundant rain when uplifted by topography or cold air pressure. After the summer monsoon has travelled a few hundred miles, its excess of water vapor becomes exhausted and so the wind no longer precipitates rain even tho it continues to go farther inland. Thus northwest China has to depend mostly upon convectional summer rain which is highly unreliable.

RAINFALL DISTRIBUTION OF CHINA

The climatic element with which the Chinese people are chiefly concerned is the rainfall. The success and well-being of the whole agricultural population is tied up with the amount, reliability and seasonal distribution of the rainfall. Temperature is second in importance.

Part of China is in the trade wind belt and trade wind belts in

some places are interrupted by monsoon winds. Where this is the case, the monsoons modify the rainfall. At the season, when the sun's altitude is great, the trade winds are overcome by the tropical monsoons. Monsoons are well developed in southern Asia and on the east coast of the continent up nearly to latitude 50°, these seasonal winds blow from the ocean in summer bringing abundant rain to the lands bordering the sea. Hongkong has an annual rainfall of 84 inches. China with a wind system associated with the tremendous seasonal temperature and pressure variations over the interior of Asia, is under the sway of the winter and summer monsoons. In general it is a land of summer rains and winter droughts. In April the summer monsoon starts in South China, by May the monsoon rains are reaching far to the north. They continue from June to September. In October dry winds from the interior begin and the winter monsoon prevails in November and thruout the winter. Tsingling, the west-east mountain bulwark seems to act as a climatic divide. South of Tsingling, the annual rainfall on the average is over 30 inches but north of Tsingling, it is decidedly lower.

As to seasonal distribution, south of Tsingling there is a comparatively more even distribution than is found in the lands north of the divide. For instance in the lower Yangtze Valley, no winter month has less than 20 mm (.79″) and no summer month has more than double the monthly average, yet in the Yellow River Valley, the winter months are usually rainless and only rarely does snow fall. The total annual rainfall (15″ to 20″) comes in the two or three summer months, usually in July and August. This gives North China a higher rainfall intensity than South China during the summer season of precipitation, even tho the north has a lower annual rainfall. In South China, the maximum rainfall comes usually in May and June. However, the frequent droughts in North China tell that the rainfall is less certain there than in the more humid south. It is interesting to note that the regions of greatest variability in rainfall often coincide with the regions of least rainfall. This is true also of semiarid United States and Australia. This naturally, is important to the different crop systems of China. As we have already seen China and the United States differ in shape and location, mountain arrangement and topography. The resultant rainfall distribution and characteristics, the foundation for the economical adjustments of the two countries, are also dif-

ferent. Hence the material culture of both differ greatly. Just to mention the food crops alone would suffice to indicate the difference. The chief food crops grown in the United States are wheat, corn and potatoes while for China, they are rice, kaoling, millet and wheat. The chief industrial crops of the United States are tobacco and cotton; while for China they are tea, silk, wood oil and other vegetable oils.

Now in the turmoil of changing times, people of different geographical settings are drawn closer and closer to one another. Industrial developments demand an increasing variety of raw materials. Production calls for more markets. The people living in the mining, manufacturing, farming and grazing regions are more interdependent than ever before. No one of these groups attempts to be self-sufficient. The regions of the west and the humid east, the regions north and south of the Tsingling should supplement each others' productions. International trade will be even more essential than in pre-war days, if we are to maintain our growing cultures, enjoy the benefits and comforts of this air age and promote the new type of civilization based on sympathy and peace. Isolation seems impossible today. But we must develop our resources and increase our give-and-take relations with the rest of the world.

SUNRISE, SUNSET, AND LENGTH OF DAY

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Day and night are never equal in length at the equator, nor are they of equal length anywhere on earth at the times of the equinoxes. This is due to refraction of the sun's rays by the earth's atmosphere.

There are, however, some facts about time of sunrise and sunset

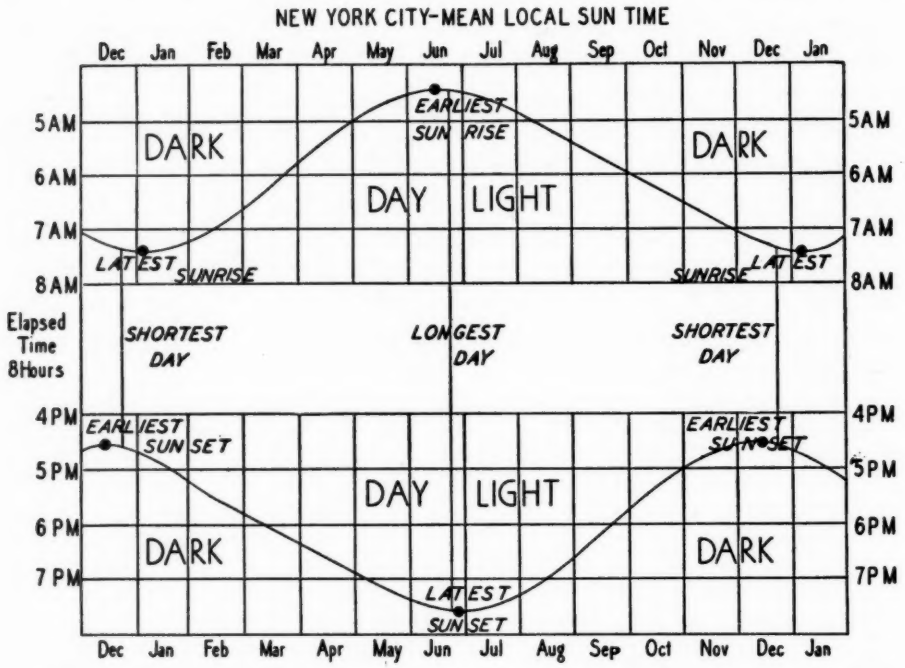

Fig. 1. Times of sunrise and sunset shown in mean local solar times for all places in the latitude of New York City. Data from World Almanac. Drawn by Harold L. Alling.

and relative length of day and night which are not so easily explainable, tho they do merit some attention. Several of these facts are illustrated on the accompanying chart. (Fig. 1)

The position of the lines showing local mean solar time of sunrise and sunset relative to the line of mean solar noon shows that, except for four days each year, the lapse of time from sunrise to mean solar noon is not the same as that from noon to sunset. For example, on both March 21 and September 22 the duration of sun-

light in New York City is twelve hours and eleven minutes. Since these are the dates of the equinoxes the extra eleven minutes is accounted for by refraction. But the amount of refraction in the morning is approximately equal to that in the evening, so the eleven minutes should be about evenly divided so as to bring the sunrise on each equinox to about 5:55 A.M. and the sunset to about 6:05 P.M. The chart shows, however, that on the vernal equinox the sun rises at 6:02 A.M., mean local solar time and sets at 6:13 P.M. Thus, the afternoon, from mean local solar noon to sunset, is fifteen minutes longer than the forenoon. On the other hand, on September 21 the sun rises at 5:47 and sets at 5:58. Thus it is seen that on this date the forenoon is fifteen minutes longer than the afternoon.

Now, the apparent or actual solar noon[1] should occur midway between the times indicated for sunrise and sunset so, as is readily seen, at the time of the vernal equinox mean solar noon arrives about seven minutes before the apparent or actual solar noon, while at the time of the autumnal equinox mean solar noon is about seven minutes later than apparent solar noon. Or, to state it briefly, on March 21 the clock is about seven minutes ahead of the sun, while on September 22 it is about seven minutes behind the sun.[2]

Another interesting fact readily apparent from a general observation of the accompanying chart is the lack of symmetry of the two curves. For instance, the dates of the latest sunrise in winter, December 30 thru January 11, do not coincide with the dates of earliest sunset (December 2 thru December 14), nor does either the latest sunrise or the earliest sunset occur on the shortest day of the year (December 19 thru December 23). The sun sets about three minutes later on the date of the winter solstice than it does a week or ten days earlier. On the other hand, for about a week after the winter solstice the sun continues to rise about half a minute later than it did on the solstice. Then, for about ten days the time of sunrise remains practically the same and when it does begin again to rise earlier the change is so slow that not until January 21 does it rise a minute earlier than it did on December 21.

Reference to that part of the chart which shows the time of sunrise and sunset at and near the summer solstice shows a similar

[1] Apparent solar noon is the time when the sun is directly above the local meridian. It corresponds with local mean solar noon only four days each year.

[2] For an explanation of the analemma and the reasons for the disagreement between apparent solar time and mean solar time see: Raisz, Erwin, "The Analemma," THE JOURNAL OF GEOGRAPHY, vol. 40, pp. 90-97, March 1941.

situation to exist then. The earliest sunrise occurs from June 11 to June 18,[3] while the latest sunset occurs from June 24 to July 2. One difference, however, is found. In winter the difference between the latest sunrise and the earliest sunset of the year is seven minutes less than the length of the shortest day while, in summer, the difference between the earliest sunrise and the latest sunset of the year

TABLE 1

A REFERENCE LIST OF CRITICAL DATES

Vernal equinox	March 21
Autumnal equinox	September 22
Summer solstice	June 21
Winter solstice	December 21
Shortest day	December 21
Longest day	June 21
Earliest sunrise	June 14*
Latest sunset	June 28*
Latest sunrise	January 5*
Earliest sunset	December 8*

* When time of sunset or sunrise is given to the nearest minute, there is no change in time of sunrise between June 11 and June 18 or between December 30 and January 11, and there is no change in time of sunset between December 2 and December 14 or between June 24 and July 2.

is only two minutes greater than the length of the longest day. Also the period of time during which the length of day is not significantly changed is greater in winter than in summer. Observe, for example, that the series of days from the beginning of latest sunrise to the end of earliest sunset extends from December 2 to January 11, a period of forty days, and that the difference between the longest day and the shortest day within this period is fifteen minutes. In summer the days of earliest sunrise begin on June 11 and the days of latest sunset end July 2, a period of twenty-one days, and during this time there is a total difference in length of day of only four minutes. Incidentally, if a period of forty days, starting twenty days before the summer solstice and ending twenty days after the solstice, is taken the total range of day length is only eleven minutes.

The facts stated immediately above are clearly demonstrated on the chart by the much greater tendency of the two curves to straighten out and extend parallel to each other at the times of the solstices than they do at the times of the equinoxes. At the times of the equinoxes the tendency toward parallel alignment of the two curves is reduced to a minimum. Specifically, in a period of forty

[3] See note accompanying Table 1.

days from March 1 to April 9 the length of day increases one hour and forty-six minutes while from September 2 to October 12 the day is shortened by the same amount. Thus the length of day is changing more than three times as fast in March and September as it is near the winter solstice and about five times as fast as it is near the summer solstice.

Another common misconception which a study of the chart will clarify is that concerning the relative length of autumn days as compared with winter days. The average length of day in the period from September 22 to December 21 is practically the same as that in the period from December 21 to March 21. For instance, consider February 5 and November 6. The former date is midway between the winter solstice and the spring equinox and the latter date is midway between the autumn equinox and the winter solstice. These two days, one representing the exact middle of winter and the other the exact middle of autumn, are of equal length. There is, however, a considerable difference in the time of sunrise and sunset on the two dates. In February the sun rises and sets approximately one-half hour later than it does in November. Thus, individuals whose principal reaction to the short days of winter is an awareness of how dark it is when they get up in the morning or go to work will notice the difference in time of sunrise in the two months and will probably think of the winter days as considerably shorter than the autumn days, not realizing that the difference is due to the different relationships between mean solar time (on which clock time is based) and the actual sun time.

Similarly, if summer days seem longer than spring days, altho they actually average the same, it may be due to a difference in the time of sunrise and sunset. For instance, May 21 and July 21 are practically the same in length but in May the sun rises and sets about twenty minutes earlier than it does in July. Since the sun has risen before most people awaken in the morning during these months, their chief impression relative to the length of day would be gotten from an observation of the time of sunset. The later sunsets and clearer skies which occur in July would create the impression of a considerably longer day during that month.

The foregoing discussion has been aimed primarily at dispelling several popular, but erroneous, ideas concerning the actual duration of sunlight and relationships between length of day and times of sunrise and sunset at different times during the year. The chart

is based on data specifically applicable to places in the latitude of the city of New York. Since the time data are given in local mean solar time, not standard time, the same chart can be used for all places in this latitude. For other latitudes the facts observed would be the same but for places of higher latitude the range between the shortest day and the longest day would be greater, and for places of lower latitude the range would be less. For places at the equator the two curves would be nearly, but not quite, straight lines.

FACTORS THAT INFLUENCE CLIMATE: DEVELOPED BY THE USE OF DEDUCTIVE PROBLEMS

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Factors that influence climate can be presented to a class in a thought-provoking and problem-solving manner. Often the mere sound of the phrase "factors that influence climate" sets up a bogy in the mind of both teacher and students. However, it is possible to approach this topic and to present materials that will guide the students to discover these factors for themselves. The plan suggested will interest students because it adds reality by providing a kind of vicarious experience. In addition, a more complete understanding of the factors that influence climate is developed by class participation.

What are these factors that influence climate? A partial list includes: latitude, altitude, mountain barriers, oceans, and distribution of land and water.* If the teacher's procedure is to list these terms on the blackboard for memorization, the students are overwhelmed by the array of meaningless phrases. Small wonder that the topic of climate becomes a dull and uninteresting tabulation of more unwelcome factual material. This article describes a method of using a series of deductive problems to develop a better understanding of the factors that influence climate.

* For a complete list of the factors that influence climate, refer to the appropriate books listed in the bibliography at the close of this article.

BACKGROUND OF STUDENTS

Most courses of study complete the regional treatment of the geography of the several continents by the close of the grammar grades. It is assumed that such is the background of a high school student. He is, therefore, familiar with the interpretation of wall-size relief maps used in the classroom and he has a fair amount of skill in the use of the tools for reading maps intelligently, e.g.: he is able to determine and read direction, to interpret symbols of elevation, to use different kinds of map scales, and to read latitude and longitude with some degree of ease. It may be necessary to review the distinction between weather and climate. Experiences in the observation of local weather conditions and the recording of that data serve to review the several elements that make up the weather of the home area.

PLANNING THE PROBLEMS

The plan to be discussed provides that two selected places are named by the teacher. The class studies the relief map and determines by examination of the two sites, the conditions that are common. If each student has an atlas for desk use to supplement the wall map, so much the better. The comparison of the two sites reveals several likenesses and one contrast. This one important contrast, the exception, is *one of the factors that influence climatic differences.* The contrasting condition will be self-evident if the problem has been attacked in a logical manner. After the class has become familiar with the pattern of procedure and has experienced the use of the deductive process of problem-solving, some students are able to suggest problems equal in merit to those presented by the teacher.

In order to simplify the problems, places with evident and direct relationships need to be selected. It is desirable that the single factor most directly influencing the climatic condition is easily recognized. This artificial limitation is defended on the basis of simplifying an abstract topic. It is obvious that no one climatic factor alone is entirely responsible for the complete climate of a place since the several factors always operate together and in varying degrees.

The selected examples bring out the influence of latitude on temperature, altitude on temperature, mountain barriers on rainfall and temperature, ocean currents on temperature, and dis-

tribution of land and water on temperature. After several of the controls or factors have been discovered by means of these problems, the other factors can be stated and accepted. Suitable illustrations for these can be used with the advantage of making use of the factors already developed. By now, it is evident to the reader that the teacher's preparation includes the verification of data for the places selected, the construction of graphs and tables of statistics, and the collection of illustrative visual material.

SELECTED PROBLEMS

EXAMPLE I. The problem the teacher has in mind is to guide the students to discover the factor which accounts in a large measure for the difference in climate between New York City and Belém (Para), Brazil. After the cities have been named, a student locates them on the wall map. The student with the help of the class enumerates the several ways in which these sites are *alike*. These likenesses include: (1) both cities are located on the east coast of a continent, (2) both cities are near sea level, (3) both cities are located at tidewater on a major stream. The significant *difference* in the site of the two places is *latitude*. Students should be able to recall from their previous studies of regions, some sig-

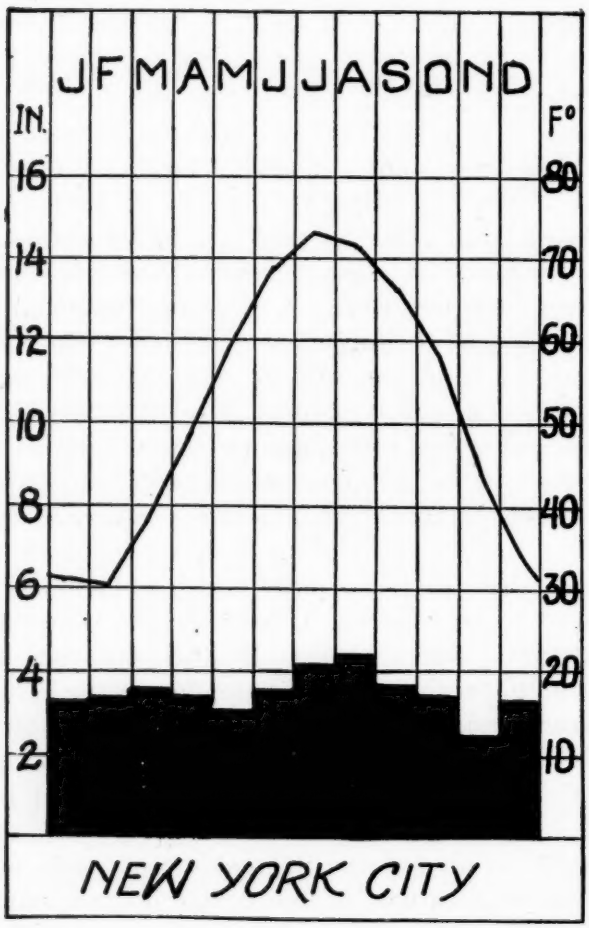

FIG. 1

nificant facts about the climate of the two places. These facts should then be verified and supplemented by the interpretation of graphs and tables of statistics showing the seasonal march of temperature and the annual monthly distribution of rainfall (Figs. 1 and 2).

An inspection of the graph for Belém shows the characteristics of the temperature to be: a uniformly high temperature thruout the year, an average monthly temperature in the high 70's, a growing season thruout the year, and an entire year free of frost. From additional data or from selected paragraph readings (see bibliography, 3, 4, 5), summaries of daily and monthly ranges will amplify the details and help to give the "feel" of the weather of Belém in contrast to the home region. Altho the temperature is the climatic element most closely related to latitude, some attention might be given to the precipitation in order to give a more complete mental picture of the conditions. An inspection of the graph shows the characteristics of the precipitation to be: almost 90 inches of rainfall per year, monthly ranges of from 14 inches in the rainier season to under 3 inches in the less rainy season. Again, from the selected readings, some details on the sky condition, the type of rainfall, the effect of the high humidity, and the frequency of rainfall showers might be added to further the understanding of

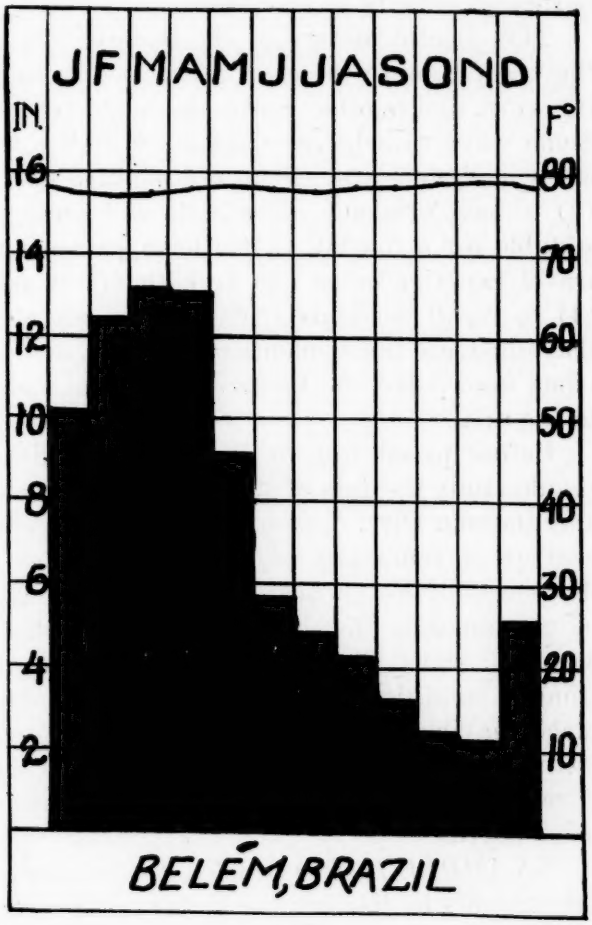

FIG. 2

weather conditions. In the same way, an analysis of the climatic picture of New York City is stated in words—the facts derived from a study of data and graphs. It is, of course, good teaching and learning procedure to relate by comparison and contrast the climatic data and "feel" of the home region to that of the unexperienced climate of elsewhere.

This mental picture of the facts of climate is to be related to the vegetation, to the work of the people living there, to the clothing worn, and to other contrasts due to latitude that are so evident. Some ways to help the students visualize the influence of differences in climate are: (1) to use pictures that show these contrasts, (2) to have students investigate and suggest the kind of clothing suitable for a tourist, (3) to have students relate from their own travel experiences to one or both of the places being compared, (4) to recall incidents from movies, travelogs, and radio stories that illustrate the elements of weather, and (5) to recall from previous knowledge the kinds of products and occupations common to the area.

Before proceeding to develop other climatic factors, the class should study the data of two other places such as Omaha, Nebraska, and Dawson City, Yukon. These have similar site features and a contrast in temperatures. For variation but not to add confusion, the places of Valparaiso, Chile, and San Diego, California might be examined on the map. The comparison reveals similarities in all major ways. The comparison of the data reveals similarities in climatic conditions. The corollary can be stated by a student, e.g. places having the same site location on a continent and the same latitude will have similar climates. The further corollary may develop the idea of opposite seasons if the sites are in opposite hemispheres.

EXAMPLE II. The problem the teacher has in mind is to guide the students to discover the factor that accounts in a large measure for the difference in the climate between Guayaquil and Quito, both in Ecuador. The procedure is like that in Example I. The similarities include a location in the same small country and only some 175 miles apart in a direct line. For practical purposes the difference of about 2° of latitude is of no consequence. The obvious difference in the sites forces itself to the attention, namely, a coastal site in contrast to a mountain plateau at an elevation of 9,350 feet.

A study of the climatic data and a series of pictures for each place shows the influence of the factor of *altitude* upon the temperature. Other stations for comparison are Longs Peak, Colorado, and McCook, Nebraska; Red Bluff and Westwood, both in California and 65 miles apart. As in Example I, the analysis of the two stations in different continents or hemispheres will serve to check clear thinking and the ability to make correct application of the principles involved, e.g. Leh, India, has about the latitude as Blythe, California, and a comparison of data will provide further application of the concept developed.

EXAMPLE III. To guide the students to discover *mountain barriers* as a factor in climate, the problem is simplified by presenting one aspect at a time, the influence of mountain barriers on (a) rainfall, and (b) temperatures. In the selection of the following stations, an attempt has been made to eliminate other modifying factors and to have as nearly similar site locations as possible. The rainfall is stated in inches.

Dubrovnik, Yugoslavia	59.2	Puerto Madryn, Argentina	5.87
Sofia, Bulgaria	24.3	Melinka, Chile	124.93
Portland, Oregon	39.43	Batum, U.S.S.R.	93.30
The Dalles, Oregon	13.68	Baku, U.S.S.R.	8.96

In the development of the concept of the influence of relief on rainfall, the use of the terms windward, leeward, and rain shadow are a natural part of vocabulary growth. The use of rainfall maps along with relief maps will readily illustrate the relationships brought out by these stations.

For part (b), the influence of mountain barriers on temperature, the stations of Prague, Czechoslovakia, and Kharkov, U.S.S.R. are used. Altho there is a difference of 265 feet in altitude, the mean annual rainfall is surprisingly similar: 19.25 inches at the former, and 19.98 inches at the latter. There is a difference of only 5 minutes in latitude. A study of the temperatures shows a wide contrast. Prague is sheltered by the rim of mountain ranges. Kharkov is on the open plains exposed to the whims of continental climate.

It is comparatively easy to find stations at the same latitude with different altitudes in which both the precipitation and the temperature reflect the influence of location with respect to relief. A few selected stations are given.

Station	Elevation	Rfl.	Temperature	Extremes
Santis, Switzerland	8,202 ft.	96.3 in.	66°	−26°
Bucharest, Rumania	276	23.17	105	−23
Biskra Oasis, Algiers	407	5.86	119	28
Geryville, Algiers	4,298	13.57	108	1
LaGuira, Venezuela	coastal	10.7	—	—
Caracas, Venezuela	3,415	32.15	91	45
Mérida, Venezuela	5,384	71.83	85	52

In using these statistics, the teacher needs to make frequent reference to the home station to strengthen the understandings and insights being developed. Altho the purpose of examining the data for these stations has been to point out contrasts, the use of two mountain communities can show likenesses. Carson City, Nevada, and Richfield, Utah, have similar amounts of rainfall and similar temperature readings. Both are landlocked and separated by mountain ranges reaching elevations over 12,000 feet. Three hundred miles separates the two places.

EXAMPLE IV. The problem of developing the understanding of the influence of *oceans* on temperature is quite simple. The stations of Hebron, Labrador, and Juneau, Alaska, have the same latitude and are less than 75 feet in elevation. Reference to the wall map shows that they are located on opposite coasts of the same continent and that one is washed by a cold current and the other by a warm current. An examination of the data shows:

	Jan.	Apr.	Jul.	Oct.	Extremes		Rfl.
Hebron	−5.7°	18.3°	47.1°	31.2°	84°	−42°	19 in.
Juneau	27.5	40.6	56.6	45.3	89	−15	83

It will be noted that the contrasts are greatest in winter and in spring. Thus the moderating influence of a water body is evident. Other equally informative stations include: Brest, France and St. John's, Newfoundland; Venice, Italy and Vladivostok, U.S.S.R. This concept of the influence of ocean currents as a factor in the climate can be broadened to include the next and last factor to be considered in this article.

EXAMPLE V. The factor of the *distribution of land and water* and its influence on temperature can be seen by the use of the data given in the previous example in comparison with the data of Fort Chipewyan, Canada. The students will probably be astonished at the contrasts and will appreciate how great is the moderating in-

fluence of a sizable body of water. Fort Chipewyan has the doubtful honor of being one of the coldest spots on the North American continent, altho many Siberian stations have greater extremes. Here is the record:

	Jan.	Apr.	Jul.	Oct.	Extremes		Rfl.
Fort Chipewyan	−12.7°	26.6°	59.4°	32.5°	93°	−58°	12.59 in.
Bulun, U.S.S.R.	−40.0	4.6	52.7	11.3	85	−75	8.75
Verkhoyansk	−58.2	9.3	59.9	5.7	94	−94	5.05

Less spectacular but very much in the news and consciousness of every citizen is the city of Moscow, U.S.S.R. located at about 55° N. Another European capital located on about the same line is Copenhagen, Denmark. The temperature contrasts are understood when the site of one is noted on the sea and the other more than 1,000 miles eastward in the center of the land mass. The student should have a better appreciation of the part played by "General Winter" in the campaigns that took place in that part of Europe.

VARIATIONS IN PROCEDURE

It is noted that only the first example was discussed in detail. However, all the illustrations need to be examined with reasonable thoroness. To add variety to the procedure, the teacher needs to use different approaches to some of the problems. For example, the use of disconcerting comments stimulates and challenges the thinking student and arouses interest. Such a statement as "How cold is the cold of Siberia that causes wood to become as hard as iron and iron to break like glass?"

After all of the factors that influence climate have been introduced, the use of simple direct questions will aid in seeing the relation of the several factors to the total climatic picture of a place. The stating of generalizations and their corollaries serves to summarize the geographic principles illustrated.

It is also effective to use the reverse procedure: the teacher names a climatic factor and the student suggests possible sites as examples. Another summarizing exercise is to take the latitude of the home area and follow the line around the world at both north and south positions, selecting places in similar sites with similar climatic personalities. The selection of places of contrasting climatic personalities within the same latitude serves to review and orient the various climatic factors in their natural setting.

CONCLUSION

By the use of the kinds of topics and problems discussed in this article, the rote type of learning is reduced. Practical use of the knowledge of the influence of climatic factors can be made thruout the course. As other regions are studied, it is desirable to bring in apparently incidental but deliberately intentional, questions as:

"Which climatic factor applies to this condition about which you are telling us?"
"You mentioned that altitude was responsible for this difference. Give us more details."

Thruout the year, recall and exercise of these fundamental understandings of the influence of climatic factors, provide the students with simple facts that make for intelligently informed citizens.

Everyone is quite aware of the emphasis given to the training of meteorologists for the Services. Popular interest in weather and climate has been aroused by the fragmentary comments coming from the war theaters and in letters coming from the battlefronts. Reports of pathetic and ridiculous incidents due to lack of knowledge of climatic conditions in other parts of the world, as well as in the United States, are another source of motivating material that students can contribute. Now that censorship has been lifted on weather information, current materials for illustration are available. The more concrete and tangible the examples of climatic factors can be made, the more worth remembering this content will be from the student's point of view.

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UP IN THE AIR

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Geography has benefited much, during the last five years, from the enthusiasm of the general public for air age and global aviation. Many people have accepted, for the first time, the idea that knowledge of the world is desirable, serviceable information.

Many agencies, particularly the airlines and the Civil Aeronautics Administration have published and circulated volumes of enthusiastic propaganda intended to foster "air mindedness." On every hand beautiful maps and glowing pictures proclaim the importance of "global geography." Newspapers report the remarkable accomplishments of world flyers and in the supplements speculate without restraint upon "the air world of tomorrow."

Teachers of geography have welcomed with gratitude the changed attitudes towards their subject—so often treated as the step-child of the educational curriculum. They have accepted with sincere thanks the abundance of free and inexpensive material made available in circulars, magazines, and teaching kits.

Now, in view of all we have received, it may not be an expression of proper humility for the "curricular step-child" to look a gift horse in the mouth. But, if that gift horse is likely to become a future liability, it may be evidence of good business sense to examine his teeth before we accept full responsibility for him.

In the prestige of their newly found glory, many aviation enthusiasts, including airline publicity men, teachers, newspaper feature writers, amateur flyers, and geographers have made statements about aviation and a "New Geography" that require rather careful re-consideration.

PRESENT TECHNICAL STATUS OF AVIATION

The war has revealed remarkable accomplishments of aviation. There is little wonder that we tend to accept any utterance of aviation enthusiasts as gospel truth. We have seen so many modern miracles that we hesitate to question anything.

Planes fly everywhere. Most of us have friends and relatives flying casually to Asia, Africa, Australia, and to numerous islands of the seas. Flights from Fort Dix in New Jersey to Guam in the western Pacific scarcely rate front page space in our newspapers.

Improvements of planes are commonplace. New structural developments have rendered the planes of 1940 obsolete in many respects.

Flying, either as operator or passenger has lost much of its novelty. During the war years, hundreds of thousands of people have flown.

War Time Air Transport Service

One of the most impressive illustrations of what is physically possible in world-wide aviation is presented in the accomplishments of the Army Air Transport Command. Not only does the ATC demonstrate the physical possibilities of international aviation, it has taught thousands of workers valuable lessons as well. It has taught lessons about organization and maintenance of world air routes. It has taught much about choosing and equipping routes. It has given experience in flying in all types of climate and thru all kinds of weather. Furthermore, important lessons in packaging and stowing goods for air shipment have been applied to a wide variety of freight items and situations.

We will remember long and with pride the huge network of airways that knit together all of the important battle-fields of this war. We will remember the barriers of every sort which were overcome and will surely aspire to duplicate those accomplishments in peace time.

Peace Time Technical Possibilities

There is no technical reason why we should not be able to operate airways as efficiently after the emergency of the war has passed as we did during that emergency. It will still be within the realm of physical possibility to fly from any point on the earth to any other point within a period of sixty hours. Thousands of planes will be available where hundreds existed before the war. Many of those used for transport during the war will be convertible to peace time needs. Building capacity is great enough to provide almost any number of new planes. Many of the wartime airway installations, runways, airports, radio aids, and so forth can be adapted to commercial use.

Not only can much of the existing equipment be put to use, but new and larger types of planes have been tested and are now ready for production and integration into our world airways system.

PEACE TIME BARRIERS TO INTERNATIONAL FLIGHT

The principal barriers to peace time international flight are of two classes—economic and political. The economic barriers are those growing out of the fact that transportation systems in peace time are necessarily money making institutions. They sell service for a price. And the demand for their service determines their success or failure.

The heart that pumps life-blood into any transportation system is its traffic generating area. Such areas, the great manufacturing and market areas of the world, determine the pattern of all other transportation. There is no evidence that traffic generating areas will be less important in their influence upon air traffic lines than they are upon other types of traffic lines. Empty seats yield no profit. Planes must fly over such routes and in such numbers as the traffic requires.

The kinds of goods to be carried by planes in peace time will be determined by two factors—1) the need for speed in delivery, and 2) the value of the goods in relation to the cost of transportation.

As of July 1944 the air express rate from Miami, Florida to Rio de Janeiro, Brazil was $1.50 per pound. Any shipper wishing to send goods from the United States to Rio de Janeiro must answer the simple, economic question, "Is this service worth $1.50 per pound to me?" If the article is a machine part worth $100.00 and weighing 15 pounds, and the need for speedy delivery is urgent, the answer will doubtless be affirmative. On the other hand, the shipper of a ton of flour worth $125.00 will as surely make a negative answer to the key question.

In time of war, speed and efficiency in delivery are determining factors regardless of cost. In time of peace, cost economy places a barrier around the use of high speed and maximum efficiency. Future air service will have to adapt itself to that barrier.

The political barriers rise out of the question, "Who owns the air?" The answer to that question is one of the most widely accepted principles of international law, "Every state has complete and exclusive sovereignty over the air space above its territory."

Before the second world war that principle involved world airways in a number of complications. Turkey refused to permit airlines of other countries to fly over Turkish territory. Consequently airlines between Western Europe and Southeastern Asia and Aus-

tralia had to detour around Turkey. When Pan American Airways wished to establish its transpacific terminus in Hong Kong, the British refused the necessary permission. After we negotiated a deal with the Portuguese territory, Macau, British authorities reconsidered and opened Hong Kong to Pan American service.

Britain obstructed Pan American Airway's projection to the southwest Pacific also and made it necessary for that line to leave its direct route by making a detour to New Caledonia, and caused it to choose Auckland, New Zealand as a terminus rather than Sydney, Australia.

The United States has been as strict in its interpretation of the law of air ownership as have our competitors. We have denied Australia and Canada permission to use the air over the Hawaiian Islands for the purpose of developing an airway between those two countries.

During the war, our nationalistic prejudices and privileges have been suspended—but only temporarily. When the war ends, the political barriers reduced for the Air Transport Command will almost automatically reestablish themselves.

Anticipating probable reversion to the chaotic system that shackled air commerce before the war, the countries most interested in post-war aviation have attempted to initiate a new and improved frame-work for international control of the air.

CHICAGO CIVIL AVIATION CONFERENCE

During the period November 1 to December 7, 1944 an International Civil Aviation Conference was conducted in Chicago, Illinois.

The purpose of the Conference was to establish a pattern for international airways after the war. The participants included almost all countries of the world except the Union of Soviet Socialist Republics.

The significance of that exception is worth some consideration. A glance at a globe will impress one with the futility of anticipating trans-polar flights without Russia's participation. The "Polar Mediterranean" is a figment of imagination as long as Russia maintains an attitude of isolation in matters of international aviation.

In a recent publication an aviation enthusiast states, "Before the Air Age, people had to reckon with land and water when they wanted to go from one place to another. Maps and globes showed

these surface boundaries. But surface boundaries do not matter to us in the Air Age." It is doubtful that Russia would subscribe to the conclusion of that writer.

Conflicting ambitions of the great nations produced the major problems of the Civil Aviation Conference. Before the war several countries besides our own had great international airlines. Practically all of them, excepting ours have been inactivated or liquidated. We have the greatest present advantages. Our competitors naturally aspire to their pre-war greatness. If they are not suspicious of us they are likely at least to be cautious about any agreements they make or policies they subscribe to.

Not only ambition, but commercial philosophy is influenced by economic and geographic need. American philosophy of international aviation favors a continuation of many of the advantages we possess as results of the war. Britain's philosophy favors a return to pre-war conditions. The United States looks favorably upon free trade and competition in the air. Britain favors a restrictive, controlled policy.

Most problems arising from conflicting ambitions and conflicting philosophies were not solved by the Conference. In consequence, many people feel that the Conference failed in its major purpose. On the other hand, the actual accomplishments were numerous enough and impressive enough to justify considerable optimism concerning the future of international aviation.

At least seven items deserve mention as worthwhile accomplishments of the Conference:

1. The Conference reaffirmed the fact that every state has complete and exclusive sovereignty over the air space above its territory.

2. It recognized the exclusive nature of cabotage, that is, the transportation of goods, mail, or passengers from one point in a country to another point in the same country.

3. Fifty-four nations participated in the deliberations of the Conference.

4. There was established by the Conference a world wide basis for uniformity in essential technical matters. If planes are to fly safely from one country to another it is essential that rules and regulations concerning flight operations be similar in all countries. It could easily be disastrous if aviators were required to fly to the right around air ports in some countries and the left in others, or if weather data were dispensed according to different formulas

from country to country. Much was accomplished toward the standardization of technical matters of flight. As usual, it was easier to arrive at agreement in the international control of technical matters than in the control of economic and political matters.

5. More than thirty-two nations have signed the "Two Freedoms Document." That document specifies that civil planes of participating countries may fly over the territory of other participating countries and that they may land for other than commercial purposes.

6. About twenty nations have signed the "Five Freedoms Document." In addition to the privileges stipulated in the other document, this one permits foreign planes of other participating countries to discharge or take on cargo, mail, or passengers destined for places outside a contracting country. This document does not permit foreign planes to engage in cabotage.

For example, assuming that Britain, France, and Italy were signatories to the "Five Freedoms Document":

British planes would be permitted to fly established lanes over France or Italy.

They could make forced landings in France or Italy.

They could discharge in France goods, mail, or passengers from Great Britain or from Italy.

They could take on goods, mail, or passengers in France for delivery in Italy or any other place outside French territory.

They could not carry goods, mail, or passengers from one part of France to any other part of France or to French territory.

7. The Civil Aviation Conference created a world organization of fifty nations on a consultative level to assure nondiscrimination, to arbitrate injustices, and to foster safe and rapid growth of international civil aviation thruout the world.

CONCLUSIONS

Aviation has accomplished technical wonders. Physically it has added speed, flexibility, and a third dimension to our techniques of transportation and travel. It does, without question, create new situations and require new adaptations to our geographic environments. It has, itself, become a factor in geographic environment and geographic adaptation. But, in our enthusiasm, we must not overlook the basic principle of geography that every factor, newly introduced into the environment, must adapt itself to previously

existing factors of all sorts, physical, economic, and political. It is well for us to temper our enthusiasm with reality. Post-war development of international air services depends more upon the conquest of economic and political barriers than it does upon conquest of technical barriers.

It is our responsibility, as teachers of geography, to examine carefully and critically the flood of new and modified geographical concepts resulting from aviation's accomplishments, and from the extensive writings of aviation enthusiasts.

LESSONS IN GEOGRAPHY

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It has been said that most educational discussions become, sooner or later, a desperate attempt to escape from the problems under discussion. This type of procedure is deadening and often leaves the group without that comfortable feeling of having properly disposed of the problem. The discussions concerning geographic education are good examples of this type of thinking. An attempt is made here to redirect and focus attention on some phases of this problem.

In recent years we have learned some valuable lessons and, unfortunately, some of these have been acquired the hard way. The war has taught us some very significant lessons, many of which have been highly geographical in character; these are briefly indicated further on in this paper. It seems really wicked, however, that a war was necessary to bring the importance of this field of knowledge to the attention of the American people. It has also become more evident that educators have too long regarded geography as a subject suitable only for the training of children in the elementary grades. The belated discovery that geography is a practical study for the adult mind has been impressed upon the public during this period of world crisis, and has led to no little confusion.

There are a few leaders in positions of great responsibility who have been strikingly audible on the subject of geography; they are quoted here for the added value that may accrue to educators who are contemplating curriculum changes. Dr. John W. Stude-

baker, U. S. Commissioner of Education, felt impelled to say that ". . . aside from rather backward nations, we are more illiterate geographically than any civilized nation I know." General George C. Marshall, Chief of Staff of the U. S. Army, is quoted as saying that "The army that knows the most geography will win the war." Some one else has said, in substance, that an officer leading his men into battle has a greater respect for geography than at any other time during his whole career. General Eisenhower himself, in addition to his many other duties, is reported to have spent much time and energy in inspecting and studying the terrain of the battlefields before issuing directives to his field commanders. Moreover, a representative of the press who was with the armed forces in the Attu campaign reported that our casualties were greater due to a lack of knowledge of geography than from any other cause. The views expressed are not merely local in character; they have come to us across the plains and hills of every part of our country and from abroad. Such statements were received in Washington with a great deal of surprise, yet no one even dreamed of accusing these people of being careless in their statements. The problem naturally arose concerning the possibility of losing the war because of gaps in our educational system. The result was that more than half of the trained geographers in the colleges and universities in this country were called into the federal services and directed to use their specialized skills in the interest of the nation and the Allied cause.

LESSONS FROM THE WAR

Dr. George T. Renner, one of America's leading geographers, points out several concrete lessons which the present war has taught us about geography.[1] These lessons are paraphrased and presented here in slightly altered form, with a few additions by the present writer:

1. Much of the political unrest and economic distress in Europe prior to the present war was geographic in origin and might have been avoided, and the present war possibly prevented, by a closer adherence to the fundamental principles of geography.
2. Most of the world's major wars have originated in the unbridled sovereign nations of Europe.
3. The strategy of war is primarily geographical in character, as revealed by the facts:
   a. That hemisphere solidarity is based on geography, rather than on ideologies.

[1] Renner, George T., "What the War Has Taught Us About Geography," JOURNAL OF GEOGRAPHY, December, 1944, pp. 321-330.

b. That small neutral nations, however benevolent they may be, may endanger our national security.
c. That control of the Dardanelles by Turkey was a definite threat to Allied victory.
d. That Japan's power to wage war was very much underrated by both Great Britain and the United States.
e. That Russia is today the most powerful country in Europe and, so far as this generation is concerned, will remain so.
f. That, altho our armed forces are engaging the enemy on the battlefields of Europe and Asia, Allied victory can be delayed, or even lost, thru work-stoppages on the home fronts.

4. Our concepts of geography are inadequate, as revealed by the facts:
a. That the people of the United States know less geography than those of any other civilized nation on earth.
b. That few Americans know how to make, read, or interpret maps.
c. That the members of our armed forces knew little geography.
d. That the people of the United States had no definite idea of what was included in their hemisphere.
e. That, following the Japanese attack on Pearl Harbor, the public realized there were great gaps in our national defenses.
f. That few Americans know much about the basic principles of national power.
g. That, while the United States is immensely rich in resources, the nation is not entirely self-sufficient. Our daily life is a trip around the world.
h. That America is the most wasteful nation on earth. It has been estimated that its people throw away annually in food alone enough to feed more than 30,000,000 people.
i. That we know almost nothing about human engineering.
j. That there is in this country no public opinion that understands and backs our foreign policy.
k. That geography is changing.[2] The world of today is different from the world of yesterday, with the result that our way of life is changing.
l. That geography is a science for mature minds, as well as for children.

5. Should the peace plan adopted following the war prove ineffective and the much-talked-of World War III become a reality, it is quite probable that the United States would be attacked first—not last, as in World War II.

ELEMENTS OF CONFUSION

For more than a quarter of a century, and particularly since the beginning of the war, there has been much talk and a great deal of writing about the lack of knowledge of geography on the part of the American people. Much of this has been highly critical of the agencies and personnel charged with the responsibility for the situation. Criticisms have come from people in all walks of life; they have come from administrators in the various departments and bureaus of state and federal governments, from the press, from teachers and school administrators, and from the

[2] Picklesimer, Parnell W., "Our Changing Geography," JOURNAL OF GEOGRAPHY, October, 1943, pp. 266-271.

laity in general. It is highly probable that the most severe critics have been the school administrators and others responsible for the content of the school curriculum. School superintendents, in addressing groups of teachers and other citizens, have frequently stated without reservation that one of the most urgent needs of the schools is for more training in geography. It is clear, therefore, that the people of America should not be compelled to meet each crisis with improvisation which, while patching the immediate breach, tends to generate new misunderstandings.

Geographers, on the other hand, have been quick to admit the validity of the criticisms, and have gone a step further to point out that the study of geography in this country receives very much less emphasis than in other leading countries of the world. In Western Europe, nearly every pupil in the secondary schools is required to take several years of continuous and unified training in geography, usually under a teacher who is a specialist. In England, every high school has a graduate teacher in geography. In America, however, this is not the case. This is due in part to the too prevalent idea that anybody can teach geography. In order to succeed at his job, the geography teacher should be trained in the art of teaching. One may have a thoro knowledge of his subject and, at the same time, not be a very skillful teacher. There is no good reason why the teacher should not be as skilled a strategist as the football coach or the officer leading his men in battle. Unfortunately, there are instances where teachers with no training in geography above the elementary grades have been assigned to teach the subject, and only recently a suggestion was made by a group of educators that a teacher should be certified to teach geography provided he had had but a single course in that subject. This type of thinking is simply keeping millions of people from seeing to the heart of the problem. Geographic thinking is vitally important to good citizenship.

In some places state departments of education appear to be bogged down by the manner in which geographic education is fostered, as revealed both by an examination of their courses of study and textbook adoptions. Geography, for example, is too often buried underneath a heavy load of social science, and the teacher is directed to handle it as such. But the geography texts adopted for use in connection with such a program are often based directly upon the views of the scientific geographer. In this there is little

conceivable promise. It may be that mis-education is worse than no education at all.

One other problem calls for attention at this point. We should not lose sight of the fact that there is a definite conflict between old and new ways of geographic thinking. Formerly, place geography received much emphasis; textbooks were encyclopedic in character and were meant to be memorized; subject-matter was descriptive, rather than explanatory, and little or no causal relations were suggested. It is this interrelation between man and his physical environment that makes geography meaningful. Modern geography combines, relates, compares, and interprets a mass of scattered facts bearing upon man and his home, the earth. Consequently, whether we like it or not, it is clearly evident that the ideas of a great many people regarding geography are planted deep in the past, and these ideas are too often unsuited to modern life. It is vitally important that we have a more rapid shift from the memory to thought method of acquiring geographic information. Moreover, we have been satisfied with a smattering of geography of our own country, and failed to realize that there are places and regions on the map, even outside Washington, where things important both to America and the world take place. Isolationism as an American way of life is dead. Such situations have serious consequences, since the geographer attempts to set forth a definite point of view.[3] America is lacking in people who understand this point of view. The result is that the public is definitely puzzled, if not somewhat resentful, over the manner in which the problem is being handled. The "jam" ought to be broken, and the elements that make for confusion should be energetically attacked.

THE REMEDY

The fate of civilization today depends quite largely upon an adequate program of geographic education. And the task is definitely the responsibility of the schools and colleges. While the press is lending its support, our educators are still in the talking stage and are doing practically nothing toward improving the situation. Deeds should follow words. Geographical training must form an integral part of our educational process—from the elementary grades thru the graduate school. In this country the teaching of

[3] Merriam, W. B., "The Distinctive Contribution of the Geographic Point of View." *Education*, January, 1938, pp. 301-307.

geography has been largely confined to the elementary levels, and even here progress in the subject has been unsatisfactory in many respects. The teachers are usually trained in other fields and have a tendency to emphasize those fields. Until teachers have training in all the social sciences, including geography, the geographical parts of these courses should be questioned. In the high schools little attention is given to geography. This is the appropriate level for the teaching of principles. Moreover, there is too great a gap between grade-school geography and that taught in college. Not until this high school gap is filled in with a complete offering of geography courses can the collegiate departments come into their own. In the field of higher education geography becomes a highly specialized subject. This is the appropriate level for the presentation of a body of accurate geographic knowledge; it is the level at which to thoroly understand the geographic point of view that society is conditioned by the elements of the natural environment; and the proper place for fostering the scientific method of observing and interpreting geographic data. Students at each level, from the grades to the graduate school, should have access to the vast fund of geographic literature now published, but too little used.

Lastly, the instruction in geography should be passed on to men and women who can reasonably be described as experts both in content and the art of teaching. Only a teacher, trained in geography, can give a student a geographic appreciation, and only geography itself can train the student in geography.

WRITING OUR OWN MAP LANGUAGE

MAMIE L. ANDERZHON
Oak Park, Illinois

ASSIGNMENT

Writing our own map language.

EQUIPMENT

Some of the materials you may use are:

1. Paper, cardboard or whatever base is desired of satisfactory size and quality.
2. The base may be outline maps purchased at nominal cost from map publishers.
3. Scale (ruler)
4. Protractor
5. Lettering pens and ink. Colored inks as well as black is sometimes preferable to colored pencils.
6. Colored pencils.
7. Graph paper.
8. Carbon paper.
9. Transparent paper or cloth such as onion skin paper, acetates, or engineer's cloth.

BACKGROUND

1. A map may be made by surveying the area under observation. This requires field trips and the recording of precise measurements. The job of surveying a region for such detailed maps as our Geological Survey Maps 1:62,500 requires the use of delicate instuments, which means the surveyor is a skilled worker who has a thoro knowledge of mathematics among other requirements.

When you made the map of your school ground, your home, or square mile where you live you may have measured a plot of ground and recorded the dimensions to scale on a map. This is one of several things a surveyor must do.

In order to have an outline base for the area you may wish to use a prepared outline map, which saves valuable classroom time, or trace the map outline on to an onion skin and transfer by carbon to the base paper. (Whenever possible time is saved by using the inexpensive outline maps.)

A third procedure for making a base map is to carefully prepare

a graph transparent overlay for the map to be copied. Clip the transparent squared overlay securely to the map being copied so it will not slip out of place. Using graph paper, which may be joined if a larger map than the original is desired, the student can reproduce free hand, square for square, on to the graph paper that which lies in the corresponding square on the original.

2. The base map has of course been determined by the story the map maker (cartographer) has decided to tell, and the map maker has given some thought to the symbols he will use for representing his story as well as the color combinations and system of lettering.

These general suggestions have been developed and found useful in my own junior high classes.

1. All maps must be accurately traced or drawn if prepared outline maps have not been used.

2. On small scale maps the latitude and longitude grid lines may be latitude lines every 10 degrees and longitude lines every 15 degrees. This aids the student in estimating north and south distances quickly since there are approximately 690 miles between every 10 degrees of latitude. On large scale maps at least two latitude and two longitude lines are desirable for location and estimation of distance.

3. Water will be shown in blue.

4. Physical features will be shaded tints of green to dark browns and the coloring should always be light so lettering may be easily read thru the coloring.

5. Lettering and not cursive writing will appear on the map.

6. Each map will carry the representative fraction and the scale number of inches to a mile.

7. Each map will carry a credit for sources of the map in the lower left corner of the map border. For classroom maps the back of the map may be used for added sources or a separate source sheet may be attached.

8. Each map will carry a *LEGEND* in the lower left corner. This legend should include all of the symbols used in the map, and what each color or tint found on the map represents.

9. The name of the map, or the story it tells and the cartographer's name should appear in the lower right corner, along with a credit note which gives the sources used.

10. In so far as possible the map should tell a single story and be kept simple. Overlays may be added to the base map, each one carrying one concept.

To this list the students add their own requirements as well as revise these suggestions to meet their needs.

DIRECTIONS

(Suggestion for starting.)

1. A base map may be the local region, the state, the United States, or the world. On the base may be the physical features of drainage and relief. To this base map may be added a series of overlays which may be constructed over a period of time as geographical factors are studied.

2. If the base map is the students local region he may add his own square mile. The first overlay may well be one showing density of population. He will need to devise some scheme or pattern by which a symbol or dot represents a given number of people.

Onto this population map may be outlined to scale, village or city boundaries.

A second overlay may show how people use the natural resources, soil, water and air. These overlays may include agricultural land under cultivation, forested areas, grasslands, industrial regions, mining, and if the student lives in a fishing region the fishing banks off shore.

Another overlay may show the transportation and communication of the local region with the adjoining regions: roads, both primary and secondary, railroads, etc.

3. Another base may be smaller scale and show a larger region, which includes the areas from which the industries of the local region draws its resources, as well as the areas from which the local population's food comes. In this way the local map with its overlays calls for smaller scaled maps of larger regions with their overlays. Thus by working thru the transportation net work into the areas upon which the local region is dependent the smaller scale physical maps for the United States and the World Map may have overlays showing density of population, for example most densely populated regions of the world (population over 250 persons per square mile, moderately dense 25 to 249 persons per square mile and sparsely populated less than 25 persons per square mile).

Cereal producing regions of the nation and world. (A comparison of these two overlays helps the student see in what areas the "staff of life" is produced. Relatively close correlation exists between the population and cereal producing regions of the world.

Other overlays for the world maps may include forested regions and grasslands, both for present days and for the United States some date such as 1620.

Overlays showing agricultural regions, industrial regions such as steel manufacturing centers, mining regions, electrical power centers, etc., may be added to the base maps thruout the year.

The development of such overlays which will aid the student to observe a single factor in relation to other factors have many possibilities and require much purposeful reading and searching on the part of the student, for altho the student will find such Atlases

as *Goode's School Atlas* full of helpful information he needs to use the resources in the library to round out his understanding.

To the patterns above may be added such information as position of the sun for different seasons of the year, rainfall, drainage, and soil with its resources and land utilization.

STUDENT'S SUMMARY

The class may select specific areas for developing the interdependence existing between that region and the rest of the world. This may be his own local region, or it may be an industrial center such as Pittsburgh with its heavy steel manufacturing, Chicago with its meat-packing, Boston, New York or San Francisco as port studies.

Such a study requires considerable planning and research, for among other factors the principle items and volume of trade, both into and out of the region is investigated. Graphs and quantitative maps may be used to indicate annual volume of import and export by rail, truck, boat, etc. The student is mindful of the people who perform the many services and work, and such experiences should challenge him into observing realities in his own landscape as well as thinking in terms of the interdependence between individuals, communities and the world.

THE NATIONAL COUNCIL AT WORK

LOOKING AHEAD

The purpose of the National Council of Geography Teachers as stated in the constitution is "to increase the effectiveness of geography teaching in America." By the act of joining the NCGT the members indicate their belief in the importance of geography teaching. Because of this belief all members must be sharply aware of the increasingly great contribution that geography can and should make in the preparation of intelligent citizens in this troubled world. Effective geography teaching is not only desirable; it has become a necessity. The NCGT, as an organization of people who hold in common this awareness of the role of geography in modern education, faces greatly increased responsibilities. As officers and members let us meet the unparalleled opportunities that lie ahead with vision. Let us act with energy.

A WORKING MEMBERSHIP

With so much to accomplish, the NCGT needs active members. The founders of the organization had no intention of starting just another teacher's association. They planned a working body. During the thirty years of its existence, the NCGT has carried on such activities as fact finding, publication of geography materials, encouragement of research, cooperation with other educational organizations. If such activities are continued and expanded, there is work for many.

The membership list of the NCGT will be published this spring. An available membership list will enable the officers and the committee chairmen to use the ideas and energies of more members. It will make possible a closer relationship between national and state councils.

If you are not familiar with the organization of the NCGT, its committees and its activities, request a copy of the mimeographed bulletin, *The NCGT as a Working Organization,* from the secretary, Dr. Clyde F. Kohn, Department of Geography, Northwestern University, Evanston, Ill.

ANNUAL MEETING IN 1946

An annual meeting of the NCGT will be held in 1946, perhaps before the Christmas season. We have all missed the stimulation of program and fellowship at the annual meetings and look forward to the opportunity to meet again.

STANDARDIZATION OF THE FOURTH GRADE TEST

Results have been obtained from enough Fourth Grade Geography tests to permit the standardization of the test. With this done, the committee on tests can proceed with the work on the next test. The appreciation of the NCGT is herewith extended to all who cooperated in giving the tests and reporting results. So many helped, letters cannot be written to each.

REVISION OF THE NCGT CONSTITUTION

Discussions at the meetings of the Executive Committee in Knoxville in December emphasized the need of a thoro consideration of the constitution in the light of the changed conditions under which the organization operates. A committee on the revision of the constitution will be announced soon.

Our Thanks to Dr. Barton

The NCGT owes much to the work of Dr. Thomas F. Barton, who gives up the work of secretary after five years of service. The efficient and energetic way he has carried on the duties of secretary have enabled the NCGT to maintain continuity of effort thru several years without an annual meeting and thru several changes of officers. Few who have not held the office realize the amount of time and thought contributed by the secretary. On behalf of the entire membership we express our appreciation to Dr. Barton.

State Councils and Affiliated Organizations

We are glad to announce that Dr. Barton, now Second Vice-President, will serve as Coordinator of State Councils and Affiliated Organizations, continuing the fine work he did with these groups during his years as secretary. If you do not know about a geography council in your state or neighborhood and would like to join or to start one, write to him at Southern Illinois Normal University, Carbondale, Illinois.

Organization Page

Sponsored by the officers of the NCGT, this page will be a regular feature of the Journal of Geography. Its purpose is to inform members of the activities of their Council, and to encourage them to participate in the work of the organization. The officers would be delighted to have members send them suggestions for the work of the NCGT during the coming year.

Katheryne Thomas Whittemore
President

GEOGRAPHICAL PUBLICATIONS

Glenn T. Trewartha. **Japan: A Physical, Cultural and Regional Geography.** 607 pp., 281 photographs and illustrations. The University of Wisconsin Press, Madison, Wisconsin. 1945. $5.00.

In response to a request for geographic material on Japan, I recently recommended to a graduate student in political science Glenn Trewartha's "Japan, a Physical, Cultural, and Regional Geography." When he had finished, he asked me to suggest books of a similar nature for reading on other parts of the world. I could not think of more than two in English, James' "Latin America," and Platt's "Latin America—Countrysides and United Regions," which fall into the same class. Even these two, because of limitations on data and the enormous area they treat of, are much less complete geographies than Trewartha's book. For other parts of the world we have several scholarly works in our regional literature, like Semple's "Geography of the Mediterranean Lands," Partsch's "Central Europe," Ormsby's "France," and Newbigin's "Southern Europe," but none of them does the job in quite the same manner as Trewartha's "Japan."

It should serve as the standard description of the Japanese islands for some years to come, and it is a book for which every teacher of a Far Eastern geography course will be grateful. The clear organization, the attempt to cover all of the major topics of interest in regional geographic description, and the many good illustrations make it a most useful volume.

Trewartha's present book has grown from his earlier "Reconnaissance Geography of Japan," and in general follows the pattern of the earlier book. First come a series of introductory chapters, treating each of the major environmental and cultural features for the country as a whole, then there is a detailed regional subdivision, with good descriptions of each of the small regions. As contrasted with the "Reconnaissance Geography" a great deal more space has been given to the general treatment in the present volume. However, the regional treatment also has been improved. The author has benefited greatly by being able to draw on some of the wartime accumulations of data for government purposes, altho his own firsthand experience in Japan is readily apparent thruout the work.

One can find little to criticize adversely in so well-planned and well-written a book as this. There are a few, but very few, statistical errors; and in one or two places a paragraph parallels the thought or work of another author without adequate credit. For instance, I regret the omission of credit for figures 149a and 149b. They were taken from maps compiled by Dr. George Brightman, a talented young geographer, now dead, and with two few published materials in his name. Compared to the general excellence of the book, these are very minor criticisms. I hope that the next decade may bring into print other volumes of the same quality for other areas.

By comparison with Trewartha, another book with the same general purpose, Carus and McNichols' "Japan: its Resources and Industries" (Harper and Brothers, New York, 1944), stands up very poorly indeed. Altho it may suffice for the popular purposes for which it was probably intended, "Japan: its Resources and Industries" is not recommended for geographers. It suffers from the same shortcomings as most other geographic writing by non-geographers—insufficient sources, and amateurish (from geographic point of view) presentation. There is nothing in Carus and McNichols that you will not find better done in Trewartha.

EDWARD ACKERMAN

Harvard University

Stephen B. Jones. **Boundary-Making, A Handbook for Statesmen, Treaty Editors and Boundary Commissioners.** 268 pp. International Documents Service, Columbia University Press, New York. 1945. $3.00

This is just what it purports to be—a handbook for the guidance of all who have responsibility in making or administering boundaries. It achieves its goal with a rich array of evidence from past boundary-making, a penetrating analysis of problem, and an economy of words commendable for clarity of expression. It is to be hoped that no boundary changes following the war just ended will be made without consulting it.

Does the book also contain matter useful to geographers who are called upon to deal with boundaries only in academic pursuits? Well, everyone engaged in serious study or teaching of political geography has doubtless already found the Handbook a powerhouse of principles and a storehouse of illustrations. Not only specialists, but all teachers of geography have discovered that political geography has been thrust into the classroom by the war and demands attention. For them, already overburdened, Part I (pp. 3-54) will be treasure trove. This section summarizes the world's thought on boundaries, stressing the essential verities, and sweeping away the numerous misapprehensions that have accumulated around the subject, even in geographic writings—perhaps *especially* in geographic writings. It is an up-to-date teacher indeed who will find in these pages no fresh ideas and who will receive no jolts that dislodge old misconceptions. Beyond this, the reviewer anticipates that the geographer who has read Part I will be tempted to pursue a pleasurable adventure into the chapters on types of boundaries, particularly pp. 94-122 and 151-162.

DERWENT WHITTLESEY

Harvard University

William Herbert Hobbs. **Fortress Islands of the Pacific.** Pp. 186, $2.50, J. W. Edwards, Ann Arbor, Mich., 1945.

Books by Dr. Hobbs, emeritus professor of geology at the University, are original and interesting, and this reference work on the Pacific islands is no exception. Hobbs first classifies the islands into arcuate and strewn. Arcuate islands are the summits of curving mountain folds much of whose mass is below sea level. Some of these arc-like folds, along which the islands are strung, invade the Pacific from the Asiatic mainland like the Netherlands Indies, other arcs front the continent, for example Japan, the Philippines and the Marianas. The strewn islands, widely scattered, are of volcanic and coral origin.

Hobbs divides his two classes of Pacific islands into different types largely based on their geologic origin and physiographic history. He then discusses these types in regard to their usefulness as military bases. Hobbs recognizes the following types: group volcano (Oahu, Pearl Harbor), volcano (Tahiti), almost atoll (Truk), atoll (Kwajalein), part-raised atoll (Wake), raised atoll (Nauru), newborn arcuate (Guam), and youthful to mature arcuate islands (Guadalcanal). The best landlocked harbors he considers to exist on volcanic and arcuate islands. Airstrips can also be built if these islands are not too rugged. Some atolls are useful naval bases, those with lagoons accommodate seaplanes, and many are long enough to permit construction of airstrips. Raised atolls may supply guano or phosphate rock but lack harbors and lagoons so are of military use as lookout stations only.

The book is profusely illustrated with maps of selected islands and drawings from photographs. These maps are generally excellent altho the reviewer noted two errors on the part of the cartographer; one in Fig. 15 where the alternative name for Isabella Island in the Galapagos group is given as Charles instead of Albemarle as stated in the text, and then in Fig. 48 of Wake Island the use of the name Pan American Flipper (!) Point.

From the standpoint of the geographer after information concerning all the islands of a particular archipelago, the organization used by Hobbs sometimes requires search thru several sections for descriptions of all the included islands, when these are of different types. However, a comprehensive index makes the book very usable. The book is lithographed and well bound.

OTIS W. FREEMAN

Indiana University

Wallace West and James P. Mitchell. **Our Good Neighbors in Soviet Russia.** 274 pp., Noble and Noble, Inc., New York. 1945. $1.50

This book is well illustrated with numerous pictures and a few maps, contains a valuable pronouncing vocabulary of Russian names and a good index. The vocabulary is well suited to sixth grade pupils. It is, however, so interestingly written that it seems to me that pupils of junior and senior high school, and adults as well, would enjoy reading this book.

The purpose of writing this book as stated is: "To develop among our citizens of tomorrow a better and more thoro understanding of our good neighbors in Soviet Russia." The material included and the manner of presenting this material serves well the accomplishment of this purpose.

Chapters 1 and 2 give a general overview and history of Russia from early times down to the overthrow of the Czar. Chapters 3 to 10 discuss the country and its development under the Soviets from an agricultural to an industrial nation. Chapters 11 to 17 provide a trip to the various parts of U.S.S.R. portraying the various regions and their people. Chapter 18 treats war-torn Russia since 1941. Appendices supply data on (1) Soviet Sources of Wealth, (2) Trade Between the United States and the U.S.S.R.

In spite of carefulness in writing two small errors have crept in—one on page 104, in April "night falls about 5 P.M." Night would not fall (in April) until somewhat after 6:00 P.M. A second error on page 117, "just below the Arctic Circle" which should read just *south* of the Arctic Circle. These are only minor errors and few indeed for these days of haste. I highly recommend the reading of this book.

ANNA C. LARSON

State Teachers College
St. Cloud, Minnesota

T. A. Jaggar. **Volcanoes Declare War,** pp. 166; Fig. 34; plates 37 (3 colored). Paradise of the Pacific, Limited (Publisher), Honolulu, 1945.

Dr. Jaggar, a well known volcanologist and former director of the Hawaiian Volcano Observatory, describes in clear language the eruptions of volcanoes in the West Indies, Hawaii, New Zealand, Japan, Netherlands Indies, the Philippines, Kamchatka and other places including California and Alaska. The formation of Paricutin volcano in Mexico is also described. Many of these descriptions are based on personal observations and experiences. By the help of diagrams and figures Jaggar discusses his theory of volcanic activity.

The large size of the pages (8 x 11 inches) makes it possible to include some superior illustrations. The printing and appearance of the book is what one would expected from the publishers of the beautiful annual volume *Paradise of the Pacific.*

While not a complete compendium on volcanism, the book by Jaggar is of high value for reference purposes, will be of interest to volcanologists everywhere, and will appeal to those teachers and students wanting accurate descriptions of volcanic eruptions.

OTIS W. FREEMAN

Indiana University

NEW PUBLICATIONS

Hammond's Comparative World Atlas. 48 pp. C. S. Hammond & Company, New York 16, N.Y. 1945. 35 cents.

Detailed physical and political maps along with a set of resource maps-relief maps of each continent. Included also are indexes and statistical tables. A coupon entitles the purchaser to a supplement showing boundary changes made following the peace treaties.

Published Maps (1917-1945 inclusive). List compiled by P. J. Moran. Department of Mines and Resources, Mines and Geology Branch, Ottawa, Canada. 1945.

The Maps are listed under the various Provinces and Territories. Cost of each map is nominal.

Ed Nofziger. **Two Trees.** 52 pp. Illustrated. Printed by the American Tree Association, Washington 6, D.C. Distributed by the Forest Service, U. S. Department of Agriculture, Bankers Securities Building, Philadelphia 7, Pa. 1945.

Story and pictures in linoleum blocks. One tree suffers from bad management of a woodlot; the other tree grows where conservation is practiced. A single page features a fundamental concept of conservation and is illustrated on the opposite page by a cleverly drawn picture.

Glenn M. Horner, A. G. McCall, and F. G. Bell. **Investigation in Erosion Control and the Reclamation of Eroded Land at the Palouse Conservation Experiment Station,** Pullman, Wash., 1931-42. Technical Bulletin No. 860. 83 pp. Illustrated. U. S. Department of Agriculture, Washington, D.C. 1944.

A report of the technical advances in conservation farming designed to serve as a handbook for those technicians who are aiding farmers in conservation practices suited to specific areas and crops.

George E. Pitluga. **Science Excursions into the Community.** 154 pp. Bureau of Publications, Teachers College, Columbia University, N.Y. 1943. $1.75.

A handbook for elementary teachers offering suggestions for the effective use of field trips to enrich the science experiences of the students.

William F. Christians. **Land Utilization in Denver.** 49 pp. Illustrated. Department of Geography, University of Chicago, Ill. 1944.

Part of a dissertation submitted for the degree of Doctor of Philosophy, based on research and field studies in 1933-1936.

Erwin Raisz (Editor). **Climates of the World;** Rainfall; Natural Vegetation; Temperature; Pressure, Winds, and Ocean Currents; Religions; Languages; Accessibility; Density of Population; Occupations. A series of desk study maps. C. S. Hammond & Co., 88 Lexington Ave., New York 16, N.Y. 1944.

The various world maps are drawn on the Eckert Projection, or the polar azimuthal projection. Data are obtained from varied sources and shown by conventional symbols or by special symbols typical of Raisz's cartography. Each map could be punched to fit an 8½ x 11 inch notebook.

The JOURNAL *of* GEOGRAPHY

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